

In the Claims

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1. (Currently Amended) A method for recovery of lost/damaged data comprising the steps of:

generating ~~candidate~~ hypotheses of ~~decoding~~ for lost/damaged data within a received bitstream of data;
generating scores for the ~~candidate~~ hypotheses;
selecting a hypothesis corresponding to a best score from the generated scores;
decoding the lost/damaged data according to the selected hypothesis;
evaluating at least one ~~candidate~~ other hypothesis and selectively flagging data based upon the evaluation; and
executing an error recovery process on the flagged data.

2. (Currently Amended) The method as set forth in claim 1, wherein the ~~step of~~ evaluating comprises examining at least one score distribution of at least one ~~candidate~~ hypothesis.

3. (Currently Amended) The method as set forth in claim 2, wherein the ~~step of~~ evaluating comprises comparing the score distribution to a threshold.

4. (Currently Amended) The method as set forth in claim 2, wherein data of the received bitstream of data is divided into a plurality of block units of varying length, the ~~candidate~~ hypotheses indicate the endpoint of at least one block unit, and the ~~step of~~ evaluating is performed across at least a portion of the plurality of block units.

5. (Original) The method as set forth in claim 4, wherein data is flagged for the plurality of blocks.

6. (Original) The method as set forth in claim 4, wherein a block unit is selected from the group consisting of a block or group of blocks.

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7. (Original) The method as set forth in claim 4, wherein the block unit is of varying lengths.

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8. (Currently Amended) The method as set forth in claim 1, wherein:
the received data is divided into a plurality of block units;
the selected ~~candidate~~ hypothesis indicating the endpoint of at least one block unit; and
the ~~step of~~ evaluating comprising evaluating combined ~~candidate~~ hypotheses for at least a portion of the plurality of block units.

9. (Currently Amended) The method as set forth in claim 8, wherein the ~~step of~~ evaluating comprises generating a combined score distribution.

10. (Currently Amended) The method as set forth in claim 9, wherein the ~~step of~~ evaluating comprises comparing the combined score distribution to a combined threshold.

11. (Currently Amended) The method as set forth in claim 2, wherein the score distribution is determined according to a difference function between values derived from the scores of the ~~candidate~~ hypotheses.

12. (Currently Amended) The method as set forth in claim 2, wherein the score distribution is determined according to the difference between a best score of scores of the ~~candidate~~ hypotheses and a second best score of the scores of ~~candidate~~ the hypotheses.

13. (Original) The method as set forth in claim 1, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

14. (Original) The method as set forth in claim 1, wherein the bitstream comprises image data and the error recovery process comprises a pixel error recovery method.

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15. (Original) The method as set forth in claim 10, wherein the bitstream comprises image data divided into a plurality of blocks and the error recovery process comprises a pixel error recovery process that uses neighboring block information to recover pixel data of flagged data.

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16. (Currently Amended) An apparatus for recovery of lost/damaged data comprising:

a data recovery circuit configured to generate ~~eandidate~~-hypotheses for lost/damaged data within a received bitstream of data, generate scores for the ~~eandidate~~ hypotheses, select a hypotheses corresponding to a best score from the generated scores and decode the lost/damaged data according to the selected hypothesis;

an error propagation detection circuit coupled to the data recovery circuit, the error propagation circuit configured to selectively flag data based upon an evaluation of the ~~eandidate~~-hypotheses; and

an error recovery circuit coupled to the data recovery circuit and the error propagation detection circuit, the error recovery circuit configured to execute error recovery on the flagged data.

17. (Currently Amended) The apparatus as set forth in claim 16, wherein the error propagation circuit performs an evaluation by examining at least one score distribution corresponding to the ~~eandidate~~-hypotheses.

18. (Original) The apparatus as set forth in claim 17, wherein the error propagation/circuit performs an evaluation by comparing the score distribution to a threshold.

19. (Original) The apparatus as set forth in claim 16, wherein the bitstream comprises image data and the error recovery method comprises a pixel error recovery method.

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20. (Original) The apparatus as set forth in claim 16, wherein the bitstream comprises image data divided into blocks and the error recovery method comprises a pixel error recovery method that uses neighboring block information to recover pixel data of flagged data.

21. (Currently Amended) The apparatus as set forth in claim 17, wherein received data is divided into a plurality of block units, the ~~candidate~~ hypotheses indicating the endpoint of at least one block unit, the score distribution assembled across at least a portion of the plurality of block units.

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22. (Original) The apparatus as set forth in claim 21, wherein the error propagation detection circuit flags the data in the plurality of blocks for which an error recovery method is required.

23. (Original) The apparatus as set forth in claim 21, wherein a block unit is selected from the group consisting of a block or group of blocks.

24. (Currently Amended) The apparatus as set forth in claim 21, wherein the received data is divided into a plurality of block units, the selected ~~candidate~~ hypothesis indicating the endpoint of at least one block unit and the evaluation comprising an evaluation of combined ~~candidate~~ hypotheses for at least a portion of the plurality of block units.

25. (Original) The apparatus as set forth in claim 24, wherein the evaluation comprises a combined score distribution using score distributions corresponding to at least a portion of the plurality of block units.

26. (Original) The apparatus as set forth in claim 25, wherein the evaluation further comprises a comparison of the combined score distribution to a combined threshold.

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27. (Currently Amended) The apparatus as set forth in claim 17, wherein the score distribution is determined according to the difference between a best score of scores of the ~~candidate~~-hypotheses and a second best score of the scores of ~~candidate~~-hypotheses.

28. (Original) The apparatus as set forth in claim 16, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

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29. (Original) The apparatus as set forth in claim 16, wherein the data recovery circuit and error propagation detection circuit comprises circuitry selected from the group consisting of logic circuits and a processor.

30. (Currently Amended) A computer readable medium comprising instructions, which when executed in a processing system, cause the system to perform ~~the steps for~~ data recovery of lost/damaged data, comprising:

- generating ~~candidate~~-hypotheses of ~~decoding~~ for lost/damaged data within a received bitstream of data;
- generating scores for the ~~candidate~~-hypotheses;
- selecting a hypothesis corresponding to a best score from the generated scores;
- decoding the lost/damaged data according to the selected hypothesis;
- evaluating the ~~candidate~~-hypotheses and selectively flagging data based upon the evaluation; and
- executing an error recovery process on the flagged data.

31. (Currently Amended) The computer readable medium as set forth in claim 30, wherein evaluating comprises examining at least one score distribution of at least one ~~candidate~~-hypothesis.

32. (Original) The computer readable medium as set forth in claim 31, wherein evaluating comprises comparing the score distribution to a threshold.

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33. (Currently Amended) The computer readable medium as set forth in claim 30, wherein the data of the received bitstream of data is divided into a plurality of block units of varying length, the ~~candidate~~ hypotheses indicate the endpoint of at least one block unit, and the ~~step of~~ evaluating is performed across at least a portion of the plurality of block units.

34. (Original) The computer readable medium as set forth in claim 33, wherein data is flagged for the plurality of blocks.

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35. (Original) The computer readable medium as set forth in claim 33, wherein a block unit is selected from the group consisting of a block or group of blocks.

36. (Currently Amended) The computer readable medium as set forth in claim 30, wherein:

the received data is divided into a plurality of block units;

the selected ~~candidate~~ hypothesis indicating the endpoint of at least one block unit; and

the ~~step of~~ evaluating comprising evaluating combined ~~candidate~~ hypotheses for at least a portion of the plurality of block units.

37. (Currently Amended) The computer readable medium as set forth in claim 36, wherein the ~~step of~~ evaluating comprises generating a combined score distribution.

38. (Currently Amended) The computer readable medium as set forth in claim 37, wherein the ~~step of~~ evaluating comprises comparing the combined score distribution to a combined threshold.

39. (Original) The computer readable medium as set forth in claim 30, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

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40. (Currently Amended) An apparatus for recovery of lost/damaged data comprising ~~the steps of~~:

- means for generating ~~candidate hypotheses of decoding~~ for lost/damaged data within a received bitstream of data;
- means for generating scores for the ~~candidate hypotheses~~;
- means for selecting a hypothesis corresponding to a best score from the generated scores;
- means for decoding the lost/damaged data according to the selected hypothesis;
- means for evaluating the ~~candidate hypotheses~~ and selectively flagging data based upon the evaluation; and
- means for executing an error recovery process on the flagged data.

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41. (Currently Amended) A method for recovery of data comprising ~~the steps of~~:

- generating ~~candidate hypotheses~~ for lost/damaged data within a received bitstream of data;
- assembling at least one score distribution using ~~candidate hypotheses~~; and
- selectively flagging data that an error recovery method is required for based upon the score distribution.

42. (Currently Amended) The method as set forth in claim 41, wherein data of the received bitstream of data is divided into a plurality of block units of varying length, the ~~candidate hypotheses~~ indicate the endpoint of at least one block unit, and the score distribution is assembled across at least a portion of the plurality of block units.

43. (Currently Amended) The method as set forth in claim 42, wherein the ~~step of~~ flagging selectively flags the data in the plurality of blocks for which an error recovery method is required.

44. (Currently Amended) The method as set forth in claim 42, wherein a block unit is selected from the group consisting of a block or group of blocks.

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45. (Currently Amended) The method as set forth in claim 41, wherein the received data is divided into a plurality of block units, the ~~candidate~~ hypotheses indicate the endpoint of at least one block unit, the ~~step of assembling comprising the step of~~ if a score distribution for a block unit of the plurality of block units is within a range defined by an individual threshold, generating a combined score distribution of the score distributions for at least a portion of the plurality of block units; and the ~~step of~~ flagging comprising the ~~step of~~ if the combined score distribution is within a range defined by a combined threshold, flagging that an error recovery method is required for the at least a portion of the plurality of block units.

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46. (Currently Amended) The method as set forth in claim 41, wherein the score distribution is determined according to a difference function between values derived from the scores of the ~~candidate~~ hypotheses.

47. (Currently Amended) The method as set forth in claim 41, wherein the score distribution is determined according to the difference between a best score of scores of the ~~candidate~~ hypotheses and a second best score of the scores of ~~candidate~~ hypotheses.

48. (Original) The method as set forth in claim 41, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

49. (Currently Amended) The method as set forth in claim 41, further comprising the ~~step of~~ performing an error recovery method for flagged data.

50. (Original) The method as set forth in claim 49, wherein the bitstream comprises image data and the error recovery method comprises a pixel error recovery method.

51. (Original) The method as set forth in claim 49, wherein the bitstream comprises image data divided into a plurality of blocks and the error recovery method

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comprises a pixel recovery method that uses neighboring block information to recover pixel data of flagged data.

52. (Currently Amended) An apparatus for recovery of data comprising ~~the steps~~ of:

a data recovery circuit configured to generate ~~candidate~~ hypotheses for lost/damaged data within a received bitstream of data and assemble at least one score distribution using ~~candidate~~ hypotheses; and

an error propagation detection circuit coupled to the data recovery circuit, the error propagation detection circuit configured to selectively flag data that an error recovery method is required for based upon the score distribution.

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53. (Original) The apparatus as set forth in claim 52, further comprising an error recovery circuit coupled to the error propagation detection circuit, the error recovery circuit configured to generate an error recovery method for flagged data.

54. (Original) The apparatus as set forth in claim 53, wherein the bitstream comprises image data and the error recovery method comprises a pixel error recovery method.

55. (Original) The apparatus as set forth in claim 53, wherein the bitstream comprises image data divided into blocks and the error recovery method comprises a pixel error recovery method that uses neighboring block information to recover pixel data of flagged data.

56. (Currently Amended) The apparatus as set forth in claim 53, wherein received data is divided into a plurality of block units of varying length, the ~~candidate~~ hypotheses indicating the endpoint of at least one block unit, the score distribution assembled across the plurality of block units.

57. (Original) The apparatus as set forth in claim 56, wherein the error propagation detection circuit flags the data in the plurality of blocks for which an error recovery method is required.

58. (Currently Amended) The apparatus as set forth in claim 52, wherein received data is divided into a plurality of block units, the ~~candidate~~ hypotheses indicating the endpoint of at least one block unit, the error propagation detection circuit further configured to:

generate a combined score distribution of the score distributions for at least a portion of the plurality of block units if a score distribution for a block unit of the plurality of block units is within a range defined by an individual threshold; and

selectively flag that an error recovery method is required for the at least a portion of the plurality of block units if the combined score distribution is within a range defined by a combined threshold.

59. (Currently Amended) The apparatus as set forth in claim 52, wherein the score distribution is determined according to a difference function between values derived from the scores of the ~~candidate~~ hypotheses.

60. (Currently Amended) The apparatus as set forth in claim 52, wherein the score distribution is determined according to the difference between a best score of scores of the ~~candidate~~ hypotheses and a second best score of the scores of ~~candidate~~ hypotheses.

61. (Original) The apparatus as set forth in claim 52, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

62. (Original) The apparatus as set forth in claim 52, wherein the data recovery circuit and error propagation detection circuit comprises circuitry selected from the group consisting of logic circuits and a processor.

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63. (Currently Amended) A computer readable medium comprising instructions, which when executed in a processing system, causes the system to perform ~~the steps for~~ recovery of data, comprising:

generating ~~candidate~~ hypotheses for lost/damaged data within received data;
assembling at least one score distribution using at least one ~~candidate~~ other hypothesis; and
selectively flagging data that an error recovery method is required for based upon the score distribution.

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64. (Currently Amended) The computer readable medium as set forth in claim 63, wherein received data is divided into a plurality of block units of varying length, the ~~candidate~~ hypotheses indicating the endpoint of at least one block unit, the score distribution assembled across the plurality of block units.

65. (Original) The computer readable medium as set forth in claim 64, wherein the instruction that, when executed, flags an error recovery method for the data flags an error recovery method for the plurality of blocks.

66. (Currently Amended) The computer readable medium as set forth in claim 63, wherein received data is divided into a plurality of block units of varying lengths, the ~~candidate~~ hypotheses indicating the endpoint of at least one block unit, the instruction, which, when executed, assembles a score distribution, comprises if a score distribution for a block unit of the plurality of block units is within a range defined by an individual threshold, generating a combined score distribution of the score distributions for at least a portion of the plurality of block units; and the instruction, which when executed flags data, comprises if the combined score distribution is within a range defined by a combined threshold, flagging that an error recovery method is required for the at least a portion of the plurality of block units.

67. (Currently Amended) The computer readable medium as set forth in claim 63, wherein the score distribution is determined according to a difference function between values derived from the scores of the ~~candidate~~ hypotheses.

68. (Original) The computer readable medium as set forth in claim 63, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

69. (Original) The computer readable medium as set forth in claim 63, further comprising instructions which, when executed, comprise performing an error recovery method for flagged data.

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70. (Original) The computer readable medium as set forth in claim 69, wherein the bitstream comprises image data and the error recovery method comprises a pixel error recovery method.

71. (Currently Amended) An apparatus for recovery of data comprising:
means for generating ~~candidate hypotheses~~ data recovery methods ~~to for~~
lost/damaged data;
means for assembling at least one score distribution using at least one ~~candidate~~
hypothesis; and
means for selectively flagging that an error recovery method is required based
upon the score distribution.

72. (Currently Amended) A method for recovery of data from a bitstream of data comprising ~~the steps of~~:
detecting errors in data due to error propagation within the bitstream of data; and
performing a data error recovery process on data with detected errors.

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73. (Original) The method as set forth in claim 72, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

74. (Currently Amended) The method as set forth in claim 72, wherein the ~~step of~~ detecting comprises ~~the steps of~~:

generating candidate hypotheses for lost/damaged data within a received bitstream of data;

assembling a score distribution using candidate hypotheses; and

if the score distribution is within a range defined by a threshold, detecting an error.

75. (Currently Amended) The method as set forth in claim 72, wherein the bitstream of data comprises image data and the ~~step of~~ performing a data error recovery process on data comprises using a pixel error recovery process.

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76. (Original) The method as set forth in claim 75, wherein the pixel error recovery process comprises a classified adaptive pixel error recovery process.

77. (Cancelled)

78. (Currently Amended) The method as set forth in claim 72, further comprising the ~~step of~~ receiving error flags indicative of errors with respect to data of the bitstream, said ~~step of~~ performing a data error recovery process further comprising performing the data error recovery process on the data corresponding to received error flags.

79. (Currently Amended) The method as set forth in claim 72, wherein the ~~step of~~ performing a data error recovery process is performed on at least one block unit of data.

80. (Currently Amended) The method as set forth in claim 72, further comprising the ~~steps of~~:

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decoding at least a portion of the bitstream of data;
preventing data degradation by performing a block unit recovery process on the decoded data in block units in which errors due to error propagation are detected, said ~~step of preventing~~ performed prior to the ~~step of~~ performing a data error recovery process.

81. (Currently Amended) An apparatus for recovery of data from a bitstream of data comprising ~~the steps of~~:

a data recovery circuit configured to generate ~~candidate~~ hypotheses for lost/damaged data within a received bitstream of data;

an error propagation detection circuit coupled to the data recovery circuit, said error propagation detection circuit configured to detect errors in data due to error propagation within the bitstream of data; and

an error recovery circuit coupled to the error propagation detection circuit, the error recovery circuit configured to perform a data error recovery process on data with detected errors.

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82. (Original) The apparatus as set forth in claim 81, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

83. (Currently Amended) The apparatus as set forth in claim 81, wherein the error propagation detection circuit generates ~~candidate~~ hypotheses for lost/damaged data within a received bitstream of data, assembles a score distribution using ~~candidate~~ hypotheses, and detects an error if the score distribution is within a range defined by a threshold.

84. (Original) The apparatus as set forth in claim 81, wherein the bitstream of data comprises image data and the error recovery circuit uses a pixel error recovery process.

85. (Original) The apparatus as set forth in claim 84, wherein the error recovery circuit uses a classified adaptive pixel error recovery process.

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86. (Original) The apparatus as set forth in claim 81, further comprising a pixel error flag circuit configured to receive error flags indicative of errors with respect to data of the bitstream, said error recovery circuit further configured to performing error recovery on the data corresponding to received error flags.

87. (Original) The apparatus as set forth in claim 81, wherein the error recovery circuit performs error recovery on at least one block of data.

88. (Original) The apparatus as set forth in claim 81, further comprising:
a decoder coupled to receive and decode at least a portion of the bitstream of data;
a data degradation prevention unit coupled to the decoder and the error propagation detection circuit and configured to perform a block unit recovery process on the decoded data in block units in which errors due to error propagation are detected.

89. (Currently Amended) A computer readable medium comprising instructions, which when executed in a processing system, causes the system to perform the steps for recovery of data, comprising:

detecting errors in data due to error propagation within the bitstream of data; and
performing a data error recovery process on data with detected errors.

90. (Original) The computer readable medium as set forth in claim 89, wherein the bitstream comprises data selected from the group consisting of correlated data, image data and audio data.

91. (Currently Amended) The computer readable medium as set forth in claim 89, wherein detecting comprises:

generating candidate hypotheses for lost/damaged data within a received bitstream of data;
assembling a score distribution using candidate hypotheses; and
if the score distribution is within a range defined by a threshold, detecting an error.

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92. (Original) The computer readable medium as set forth in claim 89, wherein the bitstream of data comprises image data and performing a data error recovery process on data comprises using a pixel error recovery process.

93. (Original) The computer readable medium as set forth in claim 89, further comprising instructions, which when executed performing a process comprising receiving error flags indicative of errors with respect to data of the bitstream, the instructions which when executed perform a data error recovery process further comprising performing the data error recovery process on the data corresponding to received error flags.

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94. (Original) The computer readable medium as set forth in claim 89, wherein a data error recovery process is applied to at least one block unit of data.

95. (Original) The computer readable medium as set forth in claim 94, further comprising instructions, which when executed, perform a process comprising:

decoding at least a portion of the bitstream of data;

preventing data degradation by performing a block unit recovery process on the decoded data in block units in which errors due to error propagation are detected, preventing performed prior to performing a data error recovery process.

96. (Original) An apparatus for recovery of data from a bitstream of data comprising the steps of:

means for detecting errors in data due to error propagation within the bitstream of data; and

means for performing a data error recovery process on data with detected errors.